

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of: Donald J. Merkley, et al.  
Application No.: 09/970,389  
Filing Date: October 2, 2001  
Group Art Unit: 1741  
Examiner: Mark Halpern  
Confirmation No.: 9683  
For: Method and Apparatus for Reducing Impurities in  
Cellulose Fibers for Manufacture of Fiber Reinforced  
Cement Composite Materials

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**VIA EFS-Web**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**AMENDMENT AND  
REQUEST FOR WITHDRAWAL OF FINALITY OF LAST OFFICE ACTION**

Dear Sir:

This Amendment is responsive to an Office Action mailed July 18, 2011 (hereinafter "Office Action"). Applicants respectfully request reconsideration of the finality of the rejection of said Office Action on the ground that the finality of the rejection is premature.

Applicants first wish to thank Primary Examiner Mark Halpern for holding a telephone interview with Applicants' representatives on October 4, 2011, and for agreeing to withdraw the finality of the Office Action upon showing that Applicants had only presented one amendment as part of the most recently filed Request for Continued Examination (RCE).

With this paper, Applicants respectfully request entry of the following as provided in:

**Amendments to the Claims** that begin on page 3;

**Remarks** that begin on page 11; and

**Conclusion** that begins on page 16 of this paper.

### Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the Application for patent.

1-24 (Canceled)

25. (Currently Amended) A method of making a fiber cement composite building material incorporating ~~a cementitious matrix and delignified and individualized~~ cellulose fibers, the method comprising:

~~wherein at least a portion of washing the cellulose fibers at are pretreated prior to incorporating through an elevated temperature washing process between about 65 degrees Centigrade to about 120 degrees Centigrade to reduce COD content of the cellulose fibers to less than 4.5 kg/ton, wherein the elevated temperature is between about 65 degrees Centigrade to about 120 degrees Centigrade,~~ wherein the COD content of the cellulose fibers alone is measurable from a filtrate after a portion of the cellulose fibers alone are dispersed in a solution in the absence of cement and measured prior to being combined to form the fiber cement composite building material; and

incorporating the reduced COD cellulose fibers into a cementitious mixture for making the fiber cement composite building material.

wherein the reduced COD cellulose fibers comprise about 2% to 20% by weight of the fiber cement composite building material, and wherein the reduced COD cellulose fibers increase add strength reinforcement to the fiber cement composite building material when formed by increasing the modulus of rupture (MOR) of the fiber cement composite building material by more than about 10% as compared with a fiber cement composite building material made with a same formulation containing cellulose fibers with COD content greater than 5 kg/ton of oven dried pulp measurable from a filtrate and wherein the fiber cement composite building material is autoclaved.

26. (Canceled)

27. (Canceled)

28. (Currently Amended) The method ~~composite building material~~ of Claim 25, wherein the cellulose fibers are cellulose fibers made from delignified cellulose pulps of lignocellulosic materials by a pulping process.

29. (Currently Amended) The method ~~composite building material~~ of Claim 25, wherein the fiber cement composite building material further comprises ~~comprising~~ an aggregate.

30. (Currently Amended) The method ~~composite building material~~ of Claim 29, wherein the aggregate is ground silica.

31. (Currently Amended) The method ~~composite building material~~ of Claim 25, wherein the fiber cement composite building material further comprises ~~comprising~~ one or more density modifiers.

32. (Currently Amended) The method ~~composite building material~~ of Claim 25, wherein the fiber cement composite building material further comprises ~~comprising~~ one or more additives.

33. (Cancelled)

34. (Currently Amended) The method ~~formulation~~ of Claim 25 ~~Claim 33~~, wherein the fiber cement composite building material comprises a cementitious binder ~~is selected from the group consisting of Portland cement, high alumina cement, lime, high phosphate cement, and ground granulated blast furnace slag cement, and mixtures thereof.~~

35. (Currently Amended) The method ~~formulation~~ of Claim 29 ~~Claim 33~~, wherein the aggregate is selected from the group consisting of ground silica, amorphous silica, micro silica, diatomaceous earth, coal combustion fly and bottom ashes, rice hull ash, blast furnace slag, granulated slag, steel slag, mineral oxides, mineral hydroxides, clays, magnasite or dolomite, metal oxides and hydroxides, and polymeric beads, and mixtures thereof.

36. (Currently Amended) The method formulation of Claim 31 ~~Claim 33~~, wherein the density modifier is selected from the group consisting of plastic materials, expanded polystyrene, glass and ceramic materials, calcium silicate hydrates, microspheres and volcano ashes including perlite, pumice, shirasu basalt, and zeolites in expanded forms, and mixtures thereof.

37. (Currently Amended) The method formulation of Claim 25 ~~Claim 33~~, further comprising incorporating additional fibers selected from the group consisting of natural inorganic fibers, synthetic polymer fibers, regular cellulose fibers and mixtures thereof.

38. (Currently Amended) The method formulation of Claim 25 ~~Claim 33~~, further comprising fibrillating wherein the cellulose fibers with reduced COD fibers are fibrillated to a freeness of about 150 to 750 degrees of Canadian Standard Freeness.

39. (Canceled)

40. (Currently Amended) The method formulation of Claim 25 ~~Claim 33~~, further comprising including about 10%-80% cement by weight in the cementitious mixture.

41. (Currently Amended) The method formulation of Claim 25 ~~Claim 33~~, further comprising including about 20%-80% silica by weight in the cementitious mixture.

42. (Currently Amended) The method formulation of Claim 25 ~~Claim 33~~, further comprising including about 0%-50% lightweight density modifiers by weight in the cementitious mixture.

43. (Currently Amended) The method formulation of Claim 25 ~~Claim 33~~, further comprising including about 0%-10% additives by weight in the cementitious mixture.

44. (Currently Amended) The method formulation of Claim 25 ~~Claim 33~~, wherein the cellulose fibers with reduced COD fibers improve the modulus of rupture of the fiber cement composite building material by more than about ~~20%~~ 40%, compared to a fiber cement

composite building material made with an equivalent formulation containing cellulose fibers with COD content greater than 5 kg/ton of oven dried pulp measurable from a filtrate.

45. (Currently Amended) The method formulation of Claim 25 ~~Claim 33~~, wherein the cellulose fibers with reduced COD ~~fibers~~ improve modulus of elasticity (MOE) of the fiber cement composite building material by more than about 10%, compared to a fiber cement composite building material made with an equivalent formulation containing cellulose fibers with COD content greater than 5 kg/ton of oven dried pulp measurable from a filtrate.

46. (Currently Amended) The method formulation of Claim 25 ~~Claim 33~~, wherein the cellulose fibers with reduced COD ~~fibers~~ improve ~~the~~ ultimate strain of the fiber cement composite building material by more than about 20% ~~40%~~, compared to a fiber cement composite building material made with an equivalent formulation containing cellulose fibers with COD content greater than 5 kg/ton of oven dried pulp measurable from a filtrate.

47. (Currently Amended) The method formulation of Claim 25 ~~Claim 33~~, wherein the cellulose fibers with reduced COD ~~fibers~~ reduce ~~the~~ amount of COD released to process water by more than about 10% in the manufacture of the fiber cement composite building material, compared to a fiber cement composite building material made with an equivalent formulation containing cellulose fibers with COD content greater than 5 kg/ton of oven dried pulp measurable from a filtrate.

48. (Currently Amended) The method formulation of Claim 25 ~~Claim 33~~, wherein the cellulose fibers with reduced COD ~~fibers~~ improve ~~the~~ toughness ~~physical and mechanical properties~~ of the fiber cement composite building material by more than about 10%, compared to a fiber cement composite building material made with an equivalent formulation containing a ~~fiber~~ cellulose fibers with COD content greater than 5 kg/ton of oven dried pulp measurable from a filtrate.

49-73. (Canceled)

74. (Currently Amended) A method of making a fiber reinforced composite building material ~~formulation that comprises a cementitious matrix incorporating reinforcing fibers, wherein at least a portion of the fibers are delignified cellulose fibers having a COD content of less than about 4.5 kg/ton of oven dried pulp, and wherein the composite building material formulation is manufactured into a composite building material by a method~~ comprising:

preparing delignified cellulose fibers to have a COD content of less than about 4.5 kg/ton of oven dried pulp by pretreating through an elevated temperature washing process that includes chemicals which react with COD compounds causing the COD compounds to be more soluble and to reduce COD content of the cellulose fibers to less than 4.5 kg/ton using an elevated temperature between about 65 degrees Centigrade to about 120 degrees Centigrade, wherein COD content is measurable from a filtrate obtained from prepared cellulose fibers alone in a solution in the absence of cement and prior to forming the fiber reinforced composite building material;

mixing incorporating the prepared and delignified cellulose fibers with ~~the a~~ cementitious ~~matrix and other ingredients to form a fiber cement~~ mixture;

forming the fiber cement mixture into a fiber cement article using a process selected from the group consisting of Hatschek, Mazza pipe, Magnani, injection molding, extrusion, hand lay-up, multi-wire forming, gap blade forming and bel-roll forming, the fiber cement article of a pre-selected shape and size; and

curing the fiber cement article so as to form the fiber reinforced composite building material, wherein preparing the delignified cellulose fibers increases strength reinforcement to the fiber reinforced composite building material when formed by increasing the ultimate strain by more than about 10% as-compared with a fiber reinforced composite building material made with a same formulation containing cellulose fibers with COD content greater than 5 kg/ton of oven dried pulp measurable from a filtrate.

75. (Previously Presented) The method of Claim 74, further comprising adding additional fibers into the formulation wherein the additional fibers are selected from the group consisting of natural inorganic fibers, synthetic polymer fibers, regular cellulose fibers and mixtures thereof.

76. (Cancelled)

77. (Cancelled)

78. (Currently Amended) The method ~~material formulation~~ of Claim 74 ~~claim 77~~, ~~further comprising wherein the fiber cement mixture includes~~ one or more additives.

79. (Currently Amended) The method ~~material formulation~~ of Claim 74 ~~claim 77~~, wherein the COD content of the cellulose fibers is measurable from a filtrate prior to being combined in the formulation.

80. (Currently Amended) ) The method ~~material formulation~~ of Claim 74 ~~claim 77~~, wherein the reduced COD fibers are fibrillated to a freeness of about 150 to 750 degrees of Canadian Standard Freeness before being combined in the formulation.

81. (Currently Amended) The method ~~material formulation~~ of Claim 74 ~~claim 77~~, wherein the cellulose fibers are from a softwood.



82. (Currently Amended) A fiber cement composite building material comprising a cementitious matrix and pretreated and delignified cellulose fibers with a reduced COD content, ~~wherein the cementitious matrix includes Portland cement up to about 35% by weight and a silica aggregate up to about 57% by weight of the building material,~~ wherein the delignified cellulose fibers are to about 8% by weight of the building material; wherein the delignified cellulose fibers are pretreated before incorporating into the cementitious matrix using an elevated temperature washing process to reduce COD content of the delignified cellulose fibers to less than 4.5 kg/ton of oven dried pulp and the elevated temperature is between about 65 degrees Centigrade to about 120 degrees Centigrade,

wherein COD content of the pretreated and delignified cellulose fibers is measurable from a filtrate prior to being incorporated into the cementitious matrix, and the filtrate is obtainable from dispensing the pretreated and delignified cellulose fibers into a solution without cement, and

wherein the cellulose fibers with reduced COD improve one or more of the modulus of rupture (MOR) of the fiber cement composite building material by more than about 10% or the ultimate strain of the fiber cement composite building material by more than about 10% as compared with a fiber cement composite building material made with a same formulation containing cellulose fibers with a COD content greater than 5 kg/ton of oven dried pulp measurable from a filtrate.

83. (Currently Amended) The fiber cement composite building material of Claim 82, wherein the cellulose fibers are from a softwood.

84. (Currently Amended) The fiber cement composite building material of Claim 82, wherein the cementitious matrix includes one or more density modifiers.

85. (Currently Amended) The fiber cement composite building material of Claim 82, wherein the cementitious matrix includes one or more additives.

86. (Currently Amended) The fiber cement composite building material of Claim 82, wherein COD content of the cellulose fibers is less than about 3.5 kg/ton.

87. (New) The fiber cement composite building material of Claim 82, wherein the delignified cellulose fibers are up to about 8% by weight.

88. (New) The fiber cement composite building material of Claim 82, wherein the cementitious matrix includes Portland cement up to about 35 wt.%.

89. (New) The fiber cement composite building material of Claim 82, wherein the cementitious matrix includes a silica aggregate of up to about 57 wt.%.

### **Remarks**

#### Statement of Substance of Interview Under 37 C.F.R § 1.133

Applicants submit this Statement of Substance of Interview in accordance with 37 C.F.R § 1.133 to be made of record for the subject application for patent. Applicants respectfully request entry of the statement.

Applicants first gratefully thank Primary Examiner Mark Halpern for speaking with Applicants' representative by telephone on October 4, 2011, regarding the subject application.

In the telephone interview, the Examiner agreed that the finality of the rejection set forth in the Office Action of July 18, 2011, would be withdrawn upon confirmation that Applicants had only presented one amendment as part of the most recently filed RCE.

Examiner Halpern also agreed to discuss the nature of the rejections. The Examiner suggested the claims be amended to one or more methods of making something or a process for making something. The Examiner further suggested that a structural attribute may be useful to differentiate the claims.

This is intended to be a written statement as to the substance of a telephonic interview held October 4, 2011, and to be made of record in the application for patent

#### Request for Reconsideration

Applicants may submit a request for reconsideration when the final rejection is premature. [MPEP 706.07(a), (b), (d)]. If, on request, the final rejection is premature, the finality of the Office Action is to be withdrawn. Accordingly, Applicants with this paper respectfully request reconsideration of the finality of the rejections set forth in the Office Action having a mail date of July 18, 2011. Said Office Action is premature in view of a discussion held with the Examiner on October 4, 2011, at which time the Examiner agreed upon providing evidence to remove the finality

of the Office Action, once it was confirmed that Applicants had only presented one amendment in accordance with 37 CFR 1.116(a) as part of the most recently filed RCE and that the Office Action of July 18, 2011, was only a first Office Action after the most recent RCE.

Applicants respectfully submit that there has been only one amendment, filed March 14, 2011, after submission of the most recent RCE. Said amendment, including amended claims, was said in the Office Action to necessitate new ground(s) of rejection. However, it is not proper to make final a first Office action in an RCE where the amendment raises new issues or necessitates new ground(s) of rejection. Issues raised in the most recent amendment should be further considered and/or searched.

Applicants respectfully request the finality of the most recent Office Action be withdrawn. On removal of the finality of the Office Action, claim amendments in this paper should be ordinarily entered in accordance with the rules.

#### Amendments to the Claims

Pursuant to a suggestion from the Examiner in the interview held on October 4, 2011, Applicants have amended the claims set forth herein. A summary of the claims status is below.

Claims 1-24, 26-27, 39, 49-73 were previously canceled without prejudice.

Claims 33, 76 and 77 are herewith canceled without prejudice.

Claims 87-89 are newly added without introducing any new matter.

Claims 25, 28-32, 34-38, 40-48, 74, and 78-86 have been herewith amended without introducing any new matter.

Claims 25, 28-32, 34-38, 40-48, 74, 75 and 78-81 are directed to methods of making something, as was suggested by the Examiner in the interview held October 4, 2011. Claims 82-89 are directed to a fiber cement composite building material having a structural contribution, as was also suggested by the Examiner in the interview of October 4, 2011. Said claims do not include new subject matter and are fully supported by the originally filed specification and claims. Said claims are not anticipated by or in the alternative obvious over any references previously considered, including, for example, JP 11-10631 (hereinafter, "Yamada") for reasons set forth below and also as discussed in previous remarks submitted by Applicants, such as in the most recently filed amendment of March 14, 2011.

Applicants respectfully reiterate that Yamada teaches the use of a pulp of an unknown form and teaches nothing regarding treatment of the pulp. The pulp of Yamada is mixed with cement in water for 5 minutes and the cement-pulp mixture is then filtered. COD of the filtered white water obtained from the cement-pulp mixture is then measured to determine COD content of the white water.

Yamada does not teach or suggest washing cellulose fibers or pretreating cellulose fibers before incorporating into a cementitious mixture. Yamada certainly does not teach or suggest washing cellulose fibers in an elevated temperature washing process to lower COD content of the cellulose fibers alone, as is claimed by Applicants. Yamada never pre-treats its pulp. Yamada never measures the COD content of cellulose fibers alone, as is claimed by Applicants. Yamada also does not teach or suggest that it uses cellulose fibers that are delignified, as is claimed by Applicants. In fact, Yamada does not teach or suggest that its pulp is as claimed. In addition, there is no increase in strength reinforcement in a fiber cement article made by Yamada because according to the very teachings of Yamada, there is no pre-treatment of its fibers that improve strength reinforcement.

For at least the above reasons, Yamada does not anticipate the pending claims and is not obvious over the pending claims.

Applicants further note that in rejecting the claims, the positions below are relied upon. Applicants' comments follow.

- It is a position in the Office Action that the "pulp" of Yamada is the same as the cellulose fibers as claimed. However, there is no express evidence of this anywhere in the Yamada reference. It is unknown and not expressed anywhere in Yamada what the pulp exactly is or what form it is in.
- It is a position in the Office Action that the COD measured by Yamada when mixing cement and pulp is only from pulp. It is noted, however, that a statement not supported by facts and documentary evidence cannot be relied upon in an Office Action. There is no express evidence in Yamada that cement and pulp do not interact with each other to alter a COD measurement. Applicants have provided evidence at least in the form of expert testimony to suggest that there is an interaction between cement and pulp that alters the COD measurement.
- It is a position in the Office Action that a cement-pulp slurry of Yamada having a COD of 5 ppm (when measured from the cement-pulp slurry) must mean that said pulp has a COD content less than that claimed. While the claimed COD content is measured from cellulose fibers alone, Yamada never measures COD content from pulp or fibers alone. Yamada only measures COD from a cement-pulp mixture, which, according to expert testimony can alter a COD measurement. The Examiner has provided no additional factual evidence to refute the expert testimony. Applicants have also provided evidence in the form of expert testimony and a third party testing method to show that to measure the COD of cellulose fibers, only the fibers alone can be tested. The Examiner has provided no additional factual evidence to refute this.
- It is a position in the Office Action that a method of measuring COD does not structurally differentiate the fiber cement composite. Applicants respectfully disagree. A method of measuring COD, which teaches how and under what conditions cellulose

fibers are to be measured, will either provide a correct representation of the COD content of the fibers or an incorrect representation of the COD content of the fibers. When the COD content of cellulose fibers is measured and represented correctly, as it is in Applicants' own specification, and when the cellulose fibers are treated as disclosed and claimed by Applicants, there is a structural differentiation in the fiber cement composite (as disclosed in Applicants' own specification). The differentiation includes improvements in the modulus of rupture, modulus of elasticity, the ultimate strain and toughness of the fiber cement composite material that is formed. Applicants have provided evidence in the form of expert testimony and a third party testing method to confirm that its method of measuring COD is a correct representation for measuring COD in cellulose fibers. The Examiner has provided no factual evidence to refute this.

Applicants respectfully point out that where a major technical rejection is presented in an Office Action, it must be fully developed by reasons and evidence and may not be based on a mere conclusion lacking factual evidence and supporting documents.

It is also respectfully pointed out that a statement made by an Examiner cannot be considered factual nor can it be considered an official notice without documentary evidence to support the Examiner's conclusion. Only rarely may documentary evidence be absent and only when the facts asserted are so well-known. Applicants respectfully submit that statements presented in the Office Action and identified above are not well known and, thus, require documentary evidence or facts to support each conclusion reached.

Applicants respectfully reiterate that the pending claims are not anticipated by nor are they obvious in view of cited documents. In addition, Applicants submit that final rejections to the claims are premature and should be reconsidered, and respectfully requests the finality of the most recent Office Action be removed.

### **Conclusion**

Applicants believe that the Application is in condition for allowance, and pursuant to the filing of this paper, Applicants earnestly seek allowance of the claims as provided in the Listing of Claims beginning on page 3 of this paper.

Should the Examiner have questions, comments, or suggestions in furtherance of the prosecution of this Application, please contact Applicants' representative at 214.999.4330. Applicants, through their representative, stand ready to conduct a telephone interview with the Examiner to review this Application if the Examiner believes that such an interview would assist in the advancement of this Application.

To the extent that any fees are required during pendency of this Application, including petition fees, the Commissioner is hereby authorized to charge payment of any additional fees, including any fees under 37 C.F.R. § 1.16 or 37 C.F.R. § 1.17, to Deposit Account No. 07-0153 of Gardere Wynne Sewell LLP and reference Attorney Docket No. 129843-1022.

In the event that any additional time is needed for this filing, or any additional time in excess of that requested in a petition for an extension of time, please consider this a petition for any needed extension of time pursuant to 37 C.F.R. § 1.136 or any other section or provision of Title 37. Applicants respectfully request that the Commissioner grant any such petition and authorize the Commissioner to charge the Deposit Account referenced above. Please credit any overpayments to this same Deposit Account.

This is intended to be a complete response to the Office Action mailed July 18, 2011.



**Please direct all correspondence to the practitioner listed below at Customer No. 60148.**

Respectfully submitted,

Gardere Wynne Sewell LLP

/Monique A. Vander Molen/

Monique A. Vander Molen  
Registration No. 53,716

Dated: October 18, 2011